Claims

1. A method of forming a cut (9) which encloses a partial volume (T) within a transparent material (5), by generating optical breakthroughs (8) in the material (5) by means of laser radiation (3) focused into the material (5) along an optical axis (A), wherein the focal point (7) is three-dimensionally adjusted so as to form the cut (9) by sequential arrangement of the optical breakthroughs (8), **characterized in that** the focal point (7) is adjusted along a spatial spiral (22), which is located in the cut (9) and extends along a main axis (H) that is at substantially right angles to the optical axis (A).

2. A method of forming a cut (9) which encloses a partial volume (T) within a transparent material (5), by generating optical breakthroughs (8) in the material (5) by means of laser radiation focused into the material (5) on an optical axis (A), wherein the focal point (7) is three-dimensionally adjusted so as to form the cut (9) by sequential arrangement of the optical breakthroughs (8), **characterized in that** the focal point (7) is adjusted along elevation lines (23) of the cut (9), which are located in planes that are substantially parallel to the optical axis (A).

3. The method as claimed in any one of the above claims, characterized in that the spiral (22) or each elevation line (23) is begun on a part which is posterior to the optical axis (A).

4. The method as claimed in claim 3, characterized in that the main axis (H) is located such or the planes are located such that posterior parts are not covered by previously scanned, anterior parts.

5. A device for forming a cut (9) which encloses a partial volume (T) within a transparent material (5), said device comprising a source of laser radiation (S), which focuses laser radiation (3) into the material (5) and causes optical breakthroughs (8) there, wherein a scanning unit (6, 10), which three-dimensionally adjusts the focal point (7), and a control unit, which controls the scanning unit (6, 10), are provided in order to form the cut (9) by serial arrangement of the optical breakthroughs (8) in the material (5), **characterized in that** the control unit adjusts the focal point (7) along a spatial spiral (22), which is located in the cut (9) and extends along a main axis (H) that is at substantially right angles to the optical axis (A).

6. A device for forming a cut (9) which encloses a partial volume (T) within a transparent material (5), said device comprising a source of laser radiation (S), which focuses laser radiation (3) into the material (5) and causes optical breakthroughs (8) there, wherein a scanning unit (6, 10), which three-dimensionally adjusts the focal point (7), and a control unit, which controls the scanning unit (6, 10), are provided in order to form the cut (9) by serial arrangement of the optical breakthroughs (8) in the material (5), **characterized in that** the control unit adjusts the focal point (7) along elevation lines (23), which are located in planes that are substantially parallel to the optical axis (A).

7. The device as claimed in any one of the above device claims, characterized in that the scanning unit comprises adjustable optics (6) for adjusting the focal point (7) along the optical axis (A) and a deflecting unit (10) for two-dimensional adjustment of the focal point (7) at right angles to the optical axis.

8. The device as claimed in claim 7, characterized in that the control unit controls the adjustable optics (6) according to a continuous, sinusoidal function (Fz).

9. The device as claimed in claim 8, characterized in that the control unit controls the deflecting unit (10) in one of the two spatial directions according to a sinusoidal function (Fx), and in the other of the two spatial directions according to a linear function (Fy) having an oscillation or stepped function superimposed thereon.

10. The device as claimed in any one of the above device claims, characterized in that the control unit begins the spiral (22) or each elevation line (23) on a part which is posterior to the optical axis (A).

11. The device as claimed in any one of the above device claims, characterized in that the control unit arranges the main axis (H) or the planes such that posterior parts are not covered by previously scanned anterior parts.